

Preliminary Assessment
Mound Street Power Plant
St. Louis, Missouri
TDD #F-07-8708-29 PAN #FM00579PA
Site #Y33 Project #001
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Date: June 23, 1988

Site:	La Clode Coal Gas
ID #:	MOD981715980
Break:	1-5
Other:	6-23-88

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SECTION 1: INTRODUCTION

The Ecology and Environment, Inc., Field Investigation Team (E & E/FIT) was tasked by the Region VII U.S. Environmental Protection Agency under Technical Directive Document (TDD) #F-07-8708-29, to conduct a Preliminary Assessment (PA) of the former Mound Street power plant, located in St. Louis, Missouri. This (PA) request was prompted by reports of oil accumulation in the facility and occasional oil releases to the Mississippi River. This preliminary assessment report will focus on potential chemical hazards associated with the current facility, and past operations on-site. E & E/FIT members Eric Hess and Kevin Hugill visited this site on September 17, 1987, to perform a site reconnaissance. In addition, oil samples were taken and analyzed for PCB contamination. EPA Preliminary Assessment Form 2070-12 is included as Appendix A.

SECTION 2: SITE DESCRIPTION AND HISTORY

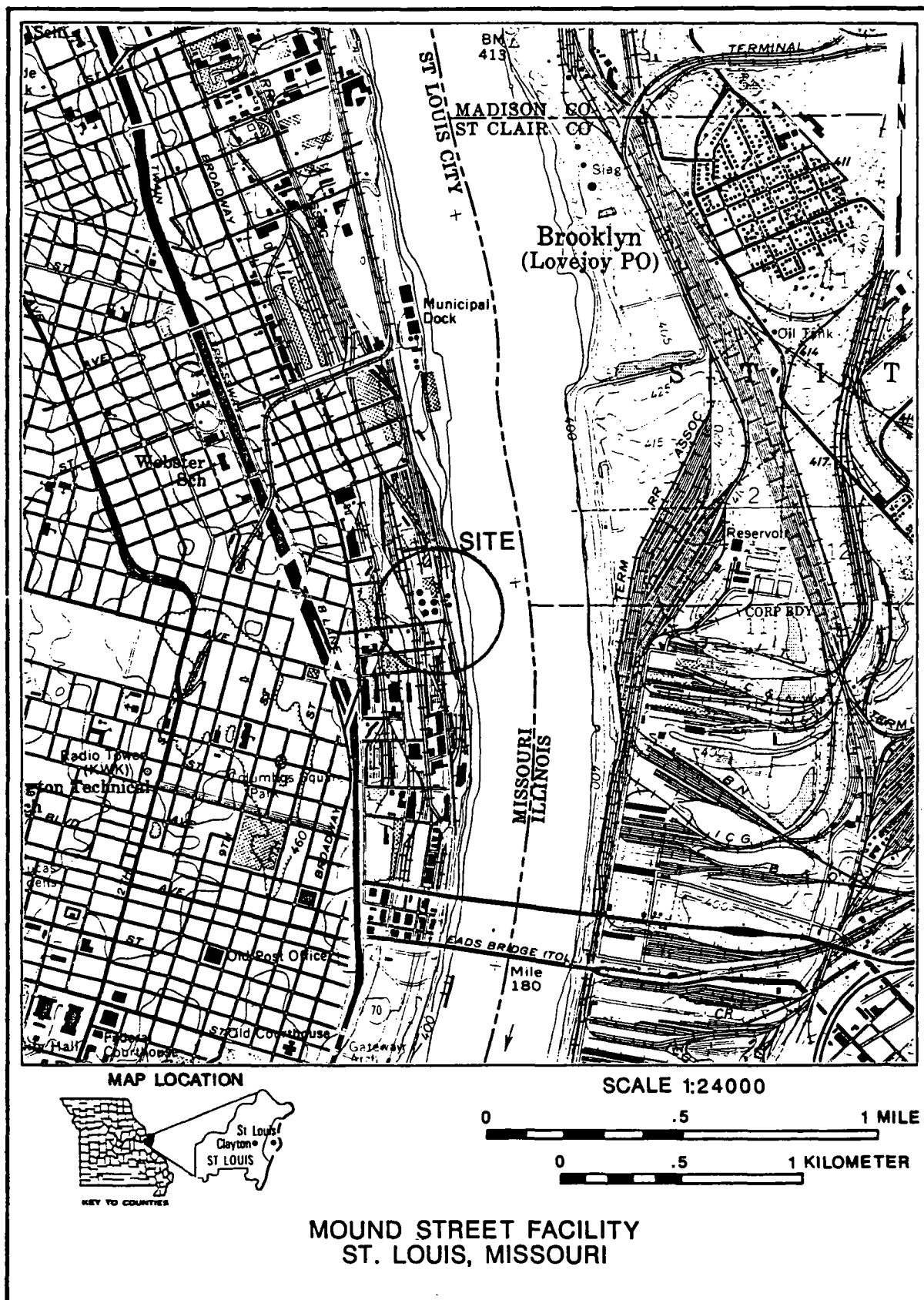
2.1 SITE DESCRIPTION

The Mound Street Power Plant is located in St. Louis, Missouri, approximately 1 mile north of the St. Louis Arch, along the Mississippi River (Ref. 1). The legal description of the power plant is city block 234-Tract #25, St. Louis Plan. The geographic coordinates of the site are 90° 11' 00".0 east longitude, and 38° 38' 30".00 north latitude (Figure 2-1). The facility is located in an industrial area adjacent to the river. Several large warehouses, a petroleum tank farm, and a large grain storage facility are all located within 1/4 mile of the facility. The tank farm is adjacent to the power plant, and the two facilities separated by several yards of paved road. Currently the site is occupied by the former Mound St. Power Plant building, and the Apex Oil Company St. Louis terminal (Figure 2-2). The site is not secured and access to the grounds buildings is relatively unrestricted. There are locks on most doors and a fence surrounds the petroleum storage tanks, no other security exists.

2.2 SITE HISTORY

The purpose of this section is to convey the close association between the current Mound Street Power Plant and the former coal gasification facility once located on this site. The two facilities should be considered one site.

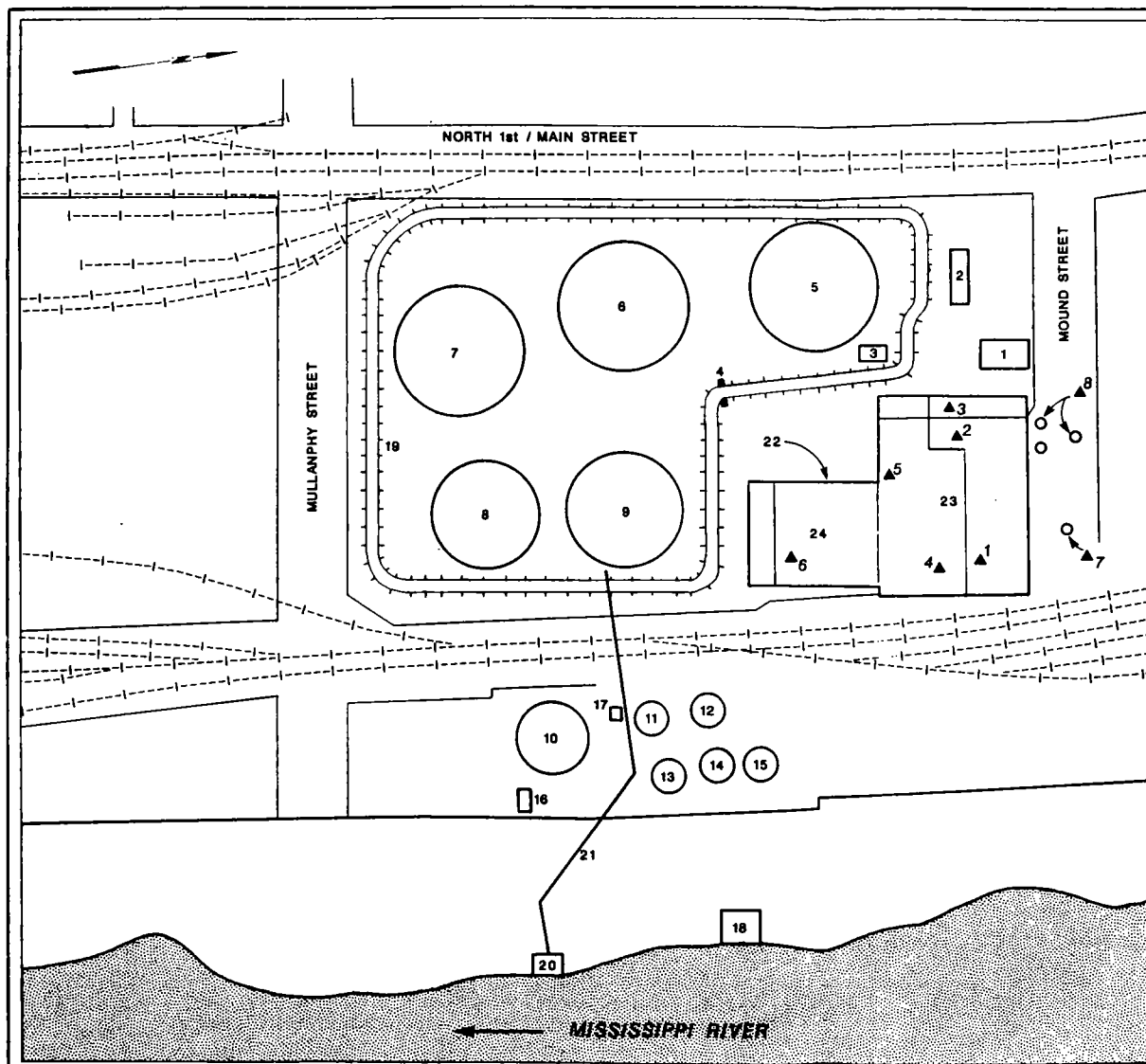
The earliest property records available indicate that this parcel of land was used by the Mound Street Warehouse Corporation until February 8, 1888 (Ref. 2). The Mound Street Warehouse Corporation sold the land and buildings to the Laclede Gas Light Company on February 8, 1888. The Laclede Company proceeded to construct a large coal gasification facility on the property. Figure 2-3 shows the Laclede Gas Facility at the turn of the century. Later, before 1904, the Laclede Company built an



WASTE SITE TRACKING NO.: MO0579
PREPARED BY: C. WILLIAMS

ECOLOGY & ENVIRONMENT FIT JAN. 1988
SOURCE: USGS 7.5' GRANITE CITY, IL. QUAD. 1982

FIGURE 2-1: SITE LOCATION



EXPLANATION

APEX OIL COMPANY ST. LOUIS TERMINAL STRUCTURES

1. OFFICE
2. TANKER TRUCK LOADING PLATFORM
3. EQUIPMENT SHED
4. ENCLOSURE DRAIN PIPE
5. FUEL OIL TANK (80,000 Barrels)
6. FUEL OIL TANK (80,000 Barrels)
7. FUEL OIL TANK (80,000 Barrels)
8. FUEL OIL TANK (50,000 Barrels)
9. FUEL OIL TANK (55,000 Barrels)
10. OIL TANK
11. CRUDE O.I. TANK
12. CRUDE OIL TANK
13. CRUDE OIL TANK
14. CRUDE OIL TANK
15. CRUDE OIL TANK
16. PUMP HOUSE
17. PUMP HOUSE
18. PUMP HOUSE (Abandoned)
19. CONTAINMENT BERM
(For Fuel Oil Tanks, Capped With A Chain-link Fence)
20. PUMP HOUSE
21. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC MOUND ST. FACILITY (Currently Owned By Mound St. Corp.)

22. FORMER UNION ELECTRIC BUILDING
23. GENERATOR ROOM (Basement Plan)
24. BOILER ROOM (Basement Plan)

- STORM SEWER LID
▲² SAMPLE LOCATION AND IDENTIFICATION

MOUND STREET FACILITY ST. LOUIS, MISSOURI (PRESENT DAY CONFIGURATION)

FIGURE 2-2



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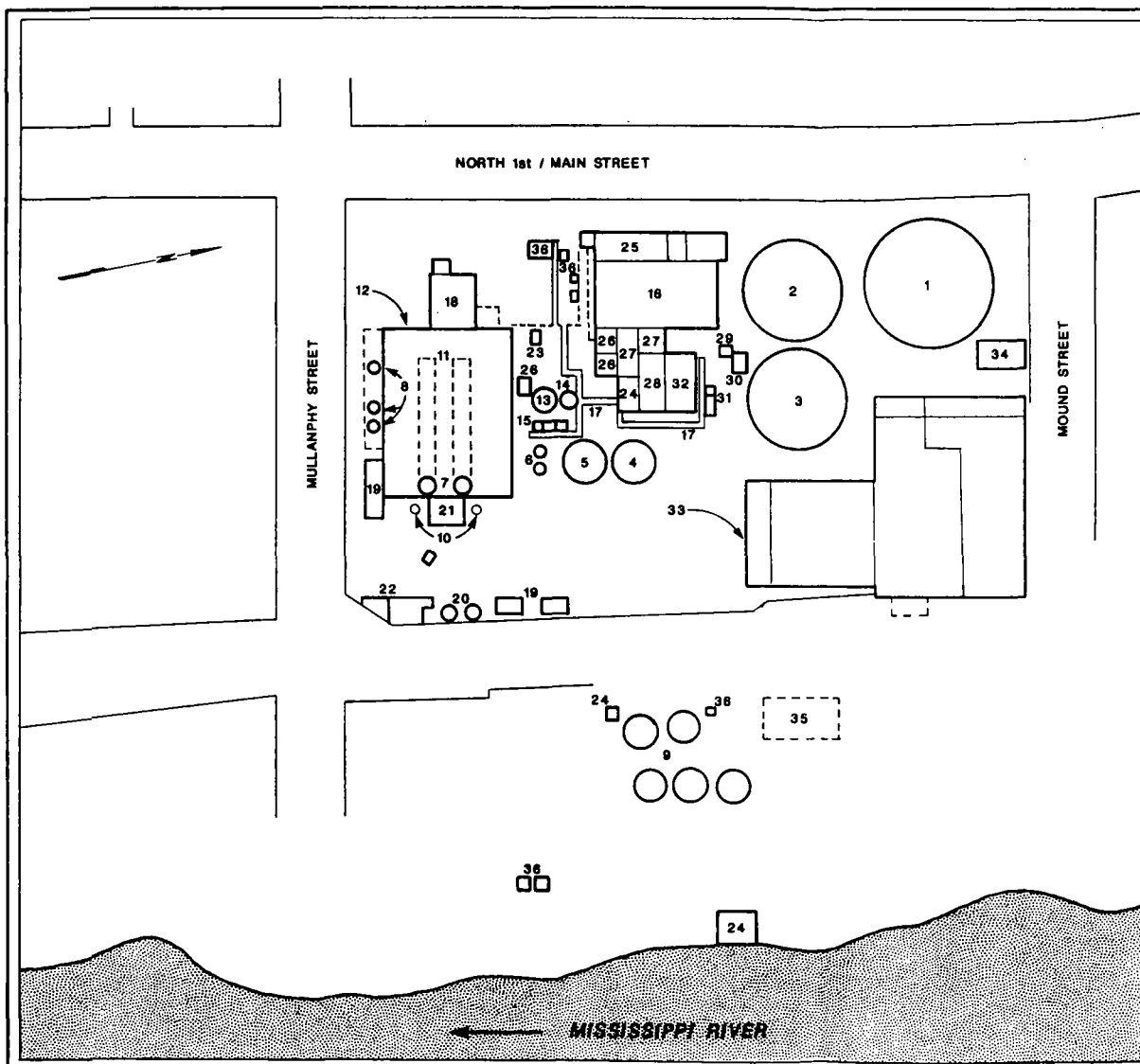
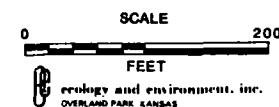
WASTE SITE TRACKING NO.: MO0579
PREPARED BY: C. WILLIAMS

EXPLANATION

1. GAS HOLDER (787,927 Cubic Feet)
2. GAS HOLDER (856,431 Cubic Feet)
3. GAS HOLDER (337,368 Cubic Feet)
4. GAS PURIFIER (805 Cubic Yards)
5. GAS PURIFIER (805 Cubic Yards)
6. 2 - GAS SCRUBBERS (2,714 Cubic Feet Each)
7. 2 - TANKS, USE UNKNOWN (2,728 Cubic Feet Each)
8. 3 - TANKS, USE UNKNOWN (2,714 Cubic Feet Each)
9. 5 - FUEL OIL TANKS (130,725 Gallons Each)
10. 2 - RETORT SMOKE STACKS (80 Feet High And 8 Feet In Diameter Each)
11. 2 - BANKS OF RETORTS
12. RETORT HOUSE
13. AMMONIA WELL (56,111 Gallons)
14. AMMONIA WELL (22,828 Gallons)
15. TAR SEPARATOR (1,2244 Gallons)
16. PURIFIER HOUSE
17. PIPE TRENCHES (3 Feet Deep By 4 Feet Wide)
18. BLOWER HOUSE
19. GARAGE
20. TAR TANKS (53,844 Gallons Each)
21. STORAGE SHED
22. BLACKSMITH AND CARPENTER SHOP
23. STORAGE HOUSE
24. PUMP HOUSE
25. OFFICE AND METER ROOM
26. LABORATORY AND MACHINE SHOP
27. SCRUBBER HOUSE
28. CONDENSER HOUSE
29. GOVERNOR HOUSE
30. VALVE HOUSE
31. METER AND SWITCH HOUSE
32. EXHAUSTERS AND BLOWERS
33. LACLEDE ELECTRIC POWER FACILITY
34. OFFICE
35. TRANSFORMERS
36. UNKNOWN

MOUND STREET FACILITY
(LACLEDE GAS AND LIGHT CO.)
ST. LOUIS, MISSOURI
CIRCA 1900

FIGURE 2-3



WASTE SITE TRACKING NO.: MO0578
PREPARED BY: C. WILLIAMS

FIT JAN. 1988

electric power plant on the facility. This facility provided all the electric and gas power for the 1904 St. Louis Worlds Fair. On March 23, 1940, the name of the facility was changed to the Laclede Power and Light Corporation (aka Laclede Electric), and the Laclede Gas Light Company (aka Laclede Gas). This suggest that the operations were separated, at least financially. At some time between 1940 and 1945 a company called Phoenix Light, Heat and Power was involved in the Laclede operations. The exact nature of their involvement was not uncovered during the present document search. On March 23, 1945, the entire facility was sold to Union Electric Company. According to Union Electric representatives, Union Electric Company never manufactured gas at this site (Ref. 3). This indicates that 1945 is the approximate closure date of the coal gasification works. Union Electric continued to use the electric power facility until 1973. In 1969 Union Electric sold the former coal gas works to the Apex Oil Company. Between 1969 and 1972 Apex Oil dismantled the old coal gas plant and constructed a petroleum tank farm on the site. This Apex facility stored various petroleum fuels until the mid 1980s when it became one of two Apex Oil asphalt product terminals in St. Louis. Currently the terminal stores and distributes asphalt and #6 fuel oil.

On August 15, 1973, Union Electric sold the electric power plant with, all its machinery intact and operational to the Tenlis Company. The Tenlis Company dismantled the power generation and transmission equipment, including boilers, generators, and transformers. The transformer oil was allegedly removed by Midwest Oil Company, of St. Louis, Missouri (Ref. 3). The equipment was sold as scrap metal. On August 17, 1981, the Tenlis Company sold the former electric works to Azcon Corporation. The Azcon Corporation may be connected with metal recycling. On October 22, 1985, Azon Corporation sold the former electric works to the Mound Street Corporation, the present site owner. Currently the building is leased by Jim McNabb, who uses the buildings to house his electric motor stripping operation.

2.3 LACLEDE COAL GASIFICATION OPERATIONS

The Laclede coal gas facility operated for almost 60 years. An estimated production schedule for this facility is listed in Table 2-1. It should be noted that this facility was over 10 times larger, in terms of production, than the Key City facility in Dubuque, Iowa. Therefore, the Laclede facility may be the largest coal gasification plant in Region VII

Table 2-1
Estimated Production Record for the
Laclede Coal Gas Plant
St. Louis, Missouri

Year	Gas Type	Gas Production Rate (ft. ³ /yr.)				By-Products (10 ³ gallons)			
		Coal	Water	Coke	Total	Coke	Tar	Ammonia	Other
1890	Coal	1,000			1,000				
1900	Coal	1,200			1,200				
1910	Coal, Water	1,200	2,800		4,000				
1920									
1930	Coal, Water, Coke	1,692	2,323	2,022	6,037	337	4,355	2,789	821,17* lbs sulfate
1940	Coke			1,969	1,969				
1950	Coke			1,338	1,338				
AVERAGES:		1,273	2,562	1,776	2,591	337	4,355	2,789	

(Ref. 4)

* Sold to the U.S. Army for munition manufacture.

In the 19th century and the first half on the 20th century, natural gas substitutes were manufactured from coal and petroleum oils. These products were distributed for a variety of residential, commercial, and industrial uses. The diverse uses of manufactured gas included the operation of home appliances, lighting, furnaces, and internal combustion engines.

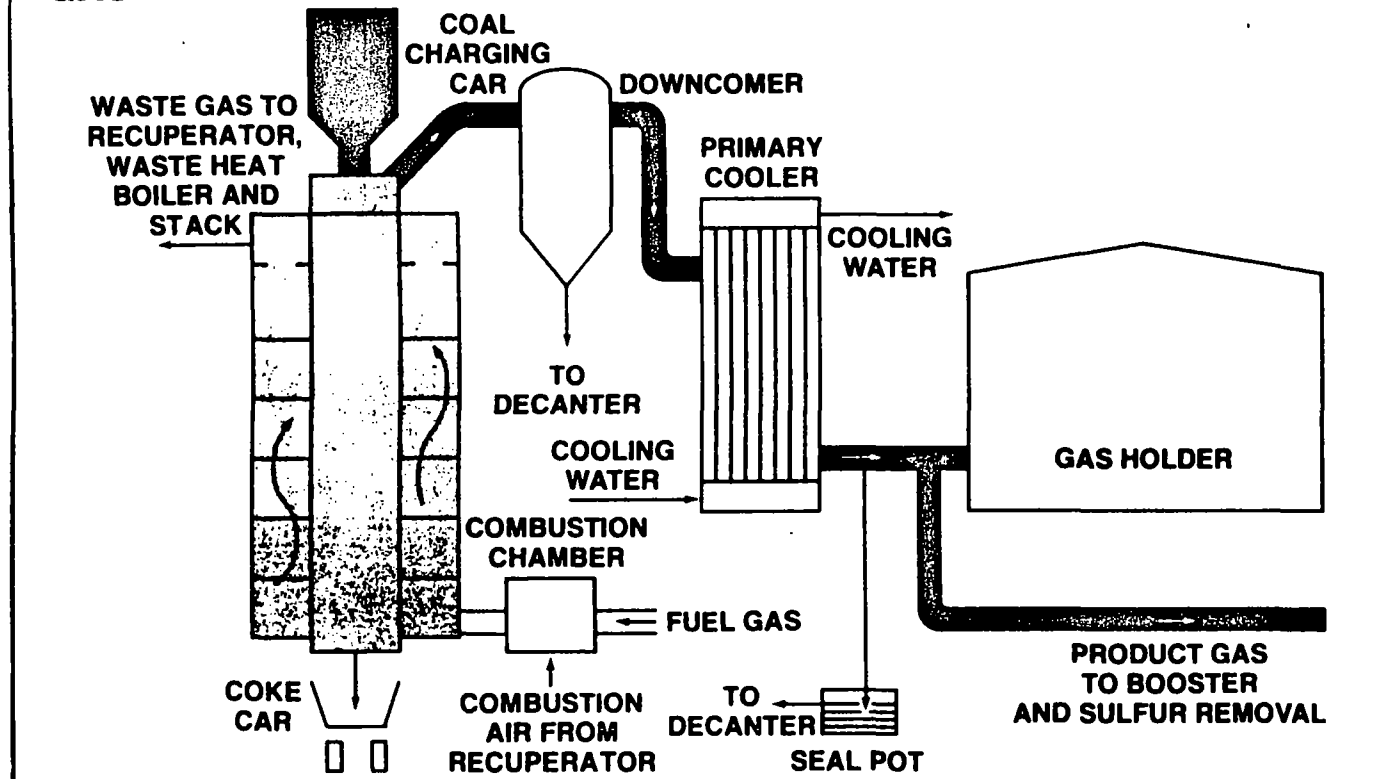
Because distribution technologies of the era were limited, manufactured gas plants were situated near areas of high demand, usually major metropolitan centers. In the late 1950s, these facilities were phased-out as petroleum and natural gas pipeline distribution facilities became widely established. Natural gas is a more convenient and economical form of energy. Many manufactured gas facilities were sold or destroyed to make way for new construction. Generally, the waste containers were left underground and in some cases were covered by new construction. Approximately 1,500 manufactured gas sites have been identified in the United States. EPA Region VII has approximately 142 coal gasification sites (Ref. 4).

The major gas manufacturing process used was the UGI intermittent retort process (Ref. 5). This method produced gas through coal carbonization (Figure 2-4). During this process, coal is heated in the retort and the resulting coal gas is removed through its top. The gas is run through a condenser and a scrubber before it is moved into the gas holder. Wastes are produced in the condenser and scrubber and in the retort itself. The coal is carbonized in batches and the resulting coke is discharged after each period of carbonization. In the latter stage of a carbonization period, steam can be introduced into the fuel bed. This displaces residual coal gas and reacts with the hot coke to produce water gas. The resulting increase in gas production is substantial. The majority of manufactured gas in the United States was produced by this process.

This manufactured gas is often called city gas, coal gas, or town gas. It is relatively rich in hydrogen, methane, and carbon monoxide, and exhibits a heating value of about 500 British thermal units/per cubic foot (Btu/cf) (Ref. 5). The coke produced by this process is highly reactive and an excellent smokeless fuel for domestic heating.

A second type of retort process is the continuous retort. It features a continuous fuel feed system and a continuous discharge of coke. An analysis of typical retort gas is listed in Table 2-2.

U.G.I. INTERMITTENT RETORT GAS PROCESS FLOW



Reference 5

THIS MANUFACTURED GAS MACHINE WAS THE MOST COMMON TYPE IN USE DURING THE PERIOD OF OPERATION FOR THE LACLEDE FACILITY.

FIGURE 2-4

Table 2-2
Chemical Composition of Typical Retort Gas

	Volume Percent in Various Gases	
	Intermittent	Continuous
Carbon Dioxide	2.1	3.0
Illuminants	3.4	2.8
Oxygen	0.4	0.2
Carbon Monoxide	13.5	10.9
Hydrogen	51.9	54.5
Methane	24.3	24.2
Nitrogen	4.4	4.4
Btu/cf	520.0	532.0
Specific Gravity	0.42	0.42

Source: Ref. 5

Another type of manufactured gas is known as blue gas or water gas. This gas is rich in hydrogen and carbon monoxide and exhibits a heating value of approximately 300 Btu/cf (Ref. 5). This product is produced by passing steam over incandescent coal or coke in a gas generator (Figure 2-5). The resulting chemical reaction is endothermic and thus is maintained by periodically forcing air into the coal or coke beds, allowing it to combust at a controlled temperature. To avoid contaminating the blue gas with excessive nitrogen or carbon dioxide, the steam and combustion phases are cycled. A chemical analysis of a typical blue gas is listed in Table 2-3.

BLUE GAS PRODUCER GAS PROCESS FLOW

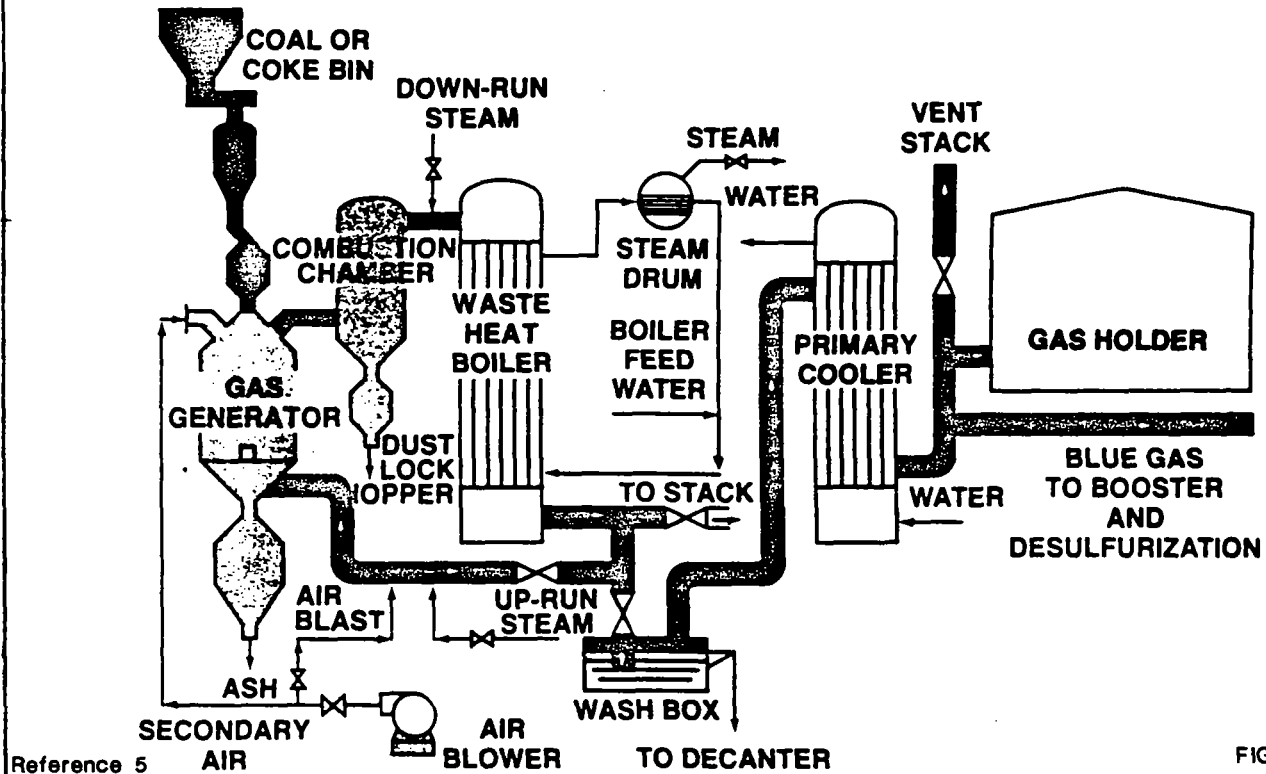


FIGURE 2-5

CARBURETED WATER GAS PRODUCER GAS PROCESS FLOW

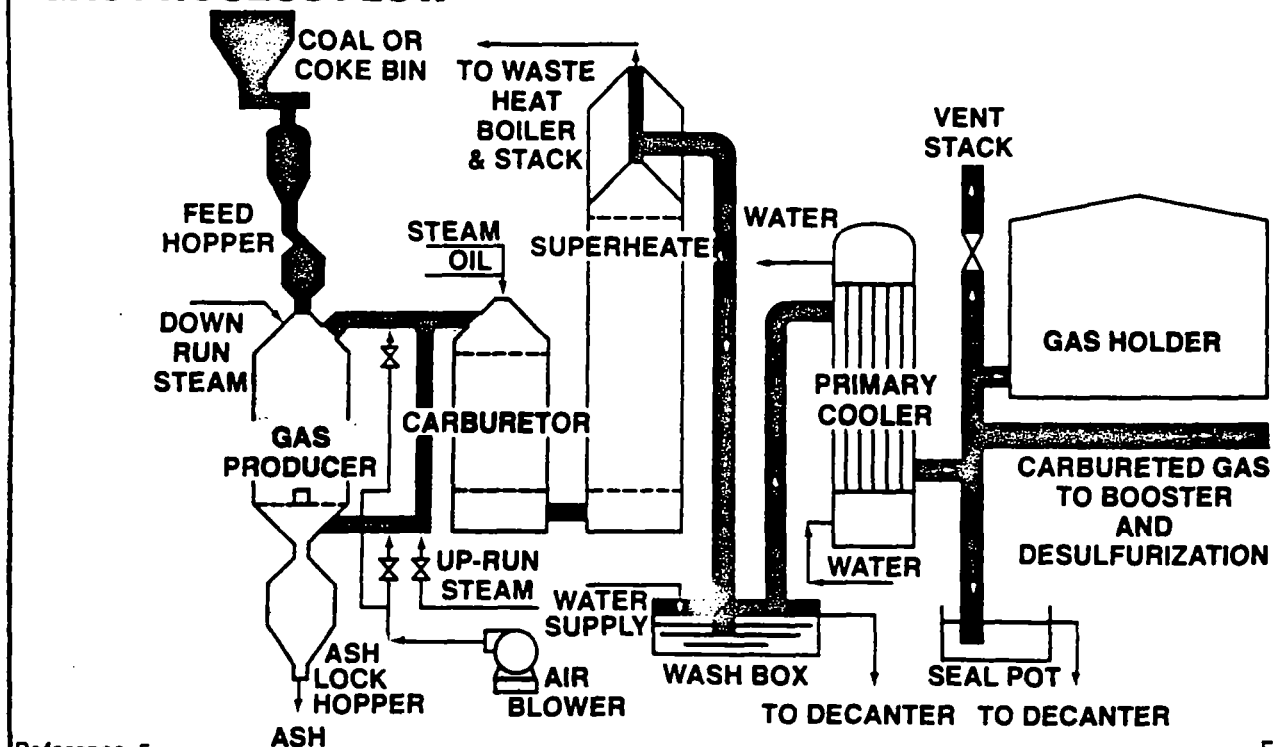


FIGURE 2-6

OTHER MANUFACTURED GAS MACHINES COMMONLY USED

DURING THE MANUFACTURED GAS ERA, 1890-1950.

Table 2-3
Chemical Composition of a Typical Blue Gas

Volume Percent of Various Gases	
Carbon Dioxide	5.5
Carbon Monoxide	37.3
Hydrogen	47.6
Methane	1.2
Nitrogen	8.4
Btu/cf	287
Specific Gravity	0.57

Source: Ref. 5

Blue gas may be enriched by cracking petroleum oil in the presence of blue gas and steam. This forms carbureted water gas (Figure 2-6). Through the proper manipulation of the oil injection, it is possible to produce a carbureted water gas with a heating value of over 1,000 Btu/cf. Analyses of typical carbureted water gases of varying heating values can be seen in Table 2-4.

Table 2-4
Chemical Composition of Typical Carbureted Water Gas

Volume Percent of Various Gases				
Carbon Dioxide	3.4	4.3	1.6	4.4
Illuminants	8.4	12.6	18.9	27.4
Oxygen	1.2	0.7	0.2	1.1
Carbon Monoxide	30.0	30.2	21.3	9.1
Hydrogen	31.7	29.3	28.0	19.9
Methane	12.2	17.8	20.7	21.8
Ethane	0.0	0.0	4.3	5.3
Propane	0.0	0.0	0.0	0.3
Nitrogen	13.1	5.1	5.0	10.7
Btu/cf	540	695	850	1010

Source: Ref. 5

The manufacturing capacity of a gasification plant is determined by the size of the gas generator or retort, the type and size of fuel used, and the rate of air and steam injection. A standard gas generator, with a 9-foot inside diameter, can produce about 6 million cubic feet (ft³) of blue gas per day. This is equivalent to almost 4,000 ft³ of blue gas per square foot of gas generator per hour (Ref. 5). A retort can produce up to 15,000 ft³ of gas per ton of coal (Ref. 6).

A conventional carbureted water gas apparatus consists of four shells: the gas generator, carburetor, superheater, and purifier (wash box) (Figure 2-6). The gas generator produces the blue gas. The blue gas is passed into a carburetor where petroleum oil is sprayed into it, producing an oil gas. This mixture is passed through the superheater where the oil vapors are converted into more simple gases. These gases are directed to a wash box for cooling, where the tars (coal tars) condense in the wash box. Unwanted constituents such as hydrogen sulfide (H₂S) also are removed at this stage. As the carburetion process is expanded, increasing the Btu/cf of the product, the production capacity of the plant is reduced.

The disposition of the by-products of the major gasification processes is presented in Table 2-5.

Table 2-5
Common By-Product Disposition
for the Average Coal Gasification Facility

By-Product	Percent of Total Produced*	
	Sold	Unaccounted for
Tar	76	24
Coke	62	38
Ammonia	N.D.	N.D.
Naphthalene, Crude	46	54
Crude Light Oil	26	74
Light Oil Derivatives	55	46
Screenings and Breeze	13	87
Spent Iron Oxide	N.D.	N.D.
Spent Lime	N.D.	N.D.

* = Based on averages from 1925, 1927, 1929, and 1931.

N.D. = No Data.

(Ref. 4)

2.4 PAST INVESTIGATIVE ACTIVITIES

Cynthia Dillion, Marine Safety Officer-United States Coast Guard, traced the initial Coast Guard involvement with this site to 1975 (Ref. 7). Since 1976 the Coast Guard has been requested to investigate three separate oil slicks on the Mississippi River, possibly originating from the former electric power facility. Although records are not complete, it appears that the oil problem in the basement of the former electric power plant was a suspected source of these oil spills. Dillion claims that the Region VII EPA was notified of this problem in 1975. The Coast Guard never sampled the oil.

On April 8, 1987, the St. Louis Division of Health sampled the oil in the basement of the former electric power plant. Daniel Wilson, Environmental Sanitation Specialist, conducted the sampling effort. Six samples were collected and analyzed for PCB. None of the samples showed PCB contamination, although no listing of the detection limits were included on the data transmittal.

On September 17, 1987, the E & E/FIT conducted a site reconnaissance of the former electric power plant. The E & E/FIT took six liquid samples from the basement of the facility and two samples from two different manholes adjacent to the facility (Figure 2-2). All samples were screened for PCBs at a 1 ppm detection limit. No PCB contaminants were identified by the Tracor gas chromatograph. Sample #1 was taken from a pool of oil/water 6 inches to 2 feet deep. Sample #2 was taken from a pool of apparently pure oil, over 6 feet deep. Sample #3 was taken from another pool of apparently pure oil, over 6 feet deep. Sample #4 was taken from a bucket of thick oil/sludge. Sample #5 was taken from a pool of oil/water over 6 feet deep. Sample #6 was taken from a pool of clear water over 8 feet deep. Samples #7 and #8 were taken from manholes containing oil/water mixtures. All samples were collected with 1/2 inch thieving rods. Samples taken from basement locations were collected in level B personal protection while conducting initial on-site monitoring. No HNu readings above background were recorded. Oxygen levels in the basement averaged 19.8%. The MSA combination O₂/explosimeter did not indicate an explosive atmosphere.

2.5 ATTRIBUTION OF OIL CONTAMINATION IN BASEMENT

Jim McNabb, manager of operations in the power plant claims that the Apex Oil terminal has had numerous oil spills, some of which have lead to the flooding of the power plant basement (Ref. 3). McNabb claims the largest spill occurred in 1981 when a flow, several feet deep, was released down Mound Street. McNabb indicated that the large transformers associated with the power plant were drained by the Tenlis Company, and removed by the Midwest Oil Company. Midwest Oil Company could not confirm or deny this fact, due to the lack of records from the early 1970s.

Tom Kniestedt, Apex Oil Company, denied that the terminal has had any major spills (Ref. 3). Rather, he indicated that the loading platform on the river has been the source of several spills. This may explain the three spills noted by the Coast Guard. Kniestedt said that the Tenlis Company drained the transformers and hydraulic oil tanks into the basement.

Herman Gellman, current president of the Mound Street Corporation, supported McNabb's statements. Gellman, as McNabb, has been associated with this site for the past fifteen years.

Based on the interviews and the sample analysis, the most likely source of the oil in the power plant basement is from spills at the Apex Oil Terminal.

2.6 SITE CONTACTS

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SECTION 3: WASTE CHARACTERISTICS
















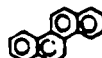

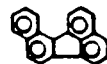






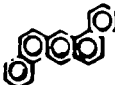
3.1 GENERAL WASTE STREAMS FOR COAL GAS SITES

The two waste products of primary concern are tar sludges (coal tars) and spent oxides. Ammonia wastes are also by-products of this production process, but are not considered hazardous. Coal tar wastes are primarily polynuclear aromatic hydrocarbons (PAHs) and phenolics produced during coal or coke combustion and during the oil injection process (Figure 3-1). Spent iron oxide wastes are produced during the gas purification process where impurities are removed from the manufactured gas. Iron oxide wastes contain sulfur compounds, cyanide compounds, and small quantities of coal tar. Light aromatics such as benzene, toluene, and xylene (volatile organic compounds) also are occasional constituents of coal tar wastes (Figure 3-1). For this study, volatile organics analysis was not requested.

Coal tars are removed from the gas in the wash box and condenser. These tars are also present in the oxide wastes. These wastes could either be sold or disposed of in pits or holding tanks. Coal tar can also be used as wood preservatives, road treatments, herbicides, or sold to coal tar refineries for further processing.

Some of the PAH compounds likely to be present in the tar wastes are carcinogenic and are listed as RCRA Part 261 hazardous wastes. All PAHs can be considered as carcinogenic as benzo(a)pyrene, a Class A carcinogen (Ref. 8). The carcinogenic potential of PAHs can be assessed through a determination of total PAH concentrations (summation of the concentrations of all PAHs detected in a given sample). Drinking water standards for PAHs are incomplete.

Iron oxide wastes are produced when manufactured gas is passed through a bed of active hydrated iron oxide. The active hydrated iron oxide is usually carried on small wood chips or corncobs. This process

<u>Component</u>	<u>Formula</u>	<u>Structure</u>	<u>Boiling Point, °C</u>
Benzene	C ₆ H ₆		80
Toluene	C ₇ H ₈		111
Xylenes	C ₈ H ₁₀		138-144
Phenol	C ₆ H ₅ OH		181
Cresols	C ₇ H ₇ OH		191-202
Xylenols	C ₈ H ₉ OH		201-227
Pyridine	C ₅ H ₅ N		115
Naphthalene	C ₁₀ H ₈		218
Methylnaphthalenes	C ₁₁ H ₁₀	-	241-245
Dimethylnaphthalenes	C ₁₂ H ₁₂	-	262-269
Acenaphthene	C ₁₂ H ₁₀		277
Carbazole	C ₁₂ H ₉ N		355
Fluorene	C ₁₃ H ₁₀		297
Anthracene	C ₁₄ H ₁₀		340
Phenanthrene	C ₁₄ H ₁₀		340
Fluoranthene	C ₁₆ H ₁₀		393
Pyrene	C ₁₆ H ₁₀		394
Chrysene	C ₁₈ H ₁₂		436
Benz(a)anthracene	C ₁₈ H ₁₂		438
Benzo(j)fluoranthene	C ₂₀ H ₁₂		~480
Benzo(k)fluoranthene	C ₂₀ H ₁₂		480
Benzo(a)pyrene	C ₂₀ H ₁₂		496
Benzo(e)pyrene	C ₂₀ H ₁₂		493
Perylene	C ₂₀ H ₁₂		460
Benzo(g,h,i)perylene	C ₂₂ H ₁₂		500
Benzo(b)chrysene	C ₂₂ H ₁₄		~500
Dibenz(a,h)anthracene	C ₂₂ H ₁₄		-

Reference 5

Chemical Compounds Associated with Coal Gasification

FIGURE 3-1

filters impurities from the raw manufactured gas. The spend oxide can be regenerated by contact with ambient air. It can be reused until tar accumulation and reaction with cyanide, which produces ferrocyanides, causes it to lose activity. The spend oxide waste is usually blue-gray in color, due to the presence of ferrocyanide salts (Ref. 5). Table 3-1 gives an analysis of typical spent iron oxide waste.

Table 3-1
An Analysis of Typical Spent Oxides

	Percent
Free Sulfur	44.70
Moisture	17.88
Ferric monohydrate	5.26
Ferrous monohydrate	6.25
Basic ferric sulfate	1.25
Ferric ammonium ferrocyanide	3.80
Ferrosoferric ammonium ferrocyanide	2.50
Ferric pyridic ferrocyanide	1.20
Organic matter peat fiber	4.68
Tar	1.21
Silica	1.05
Naphthalene	0.72
Pyridine sulfate	0.77
Ammonium sulfate	2.06
Calcium sulfate	0.12
Ferrous sulfate	0.02
Ammonium thiocyanate	1.30
Sulfur otherwise combined	1.33
Organic matter soluble in alkalies (humus)	1.54
Combined water and loss (by difference)	2.36
TOTAL	100.00

Source: Ref. 5

3.2 ENVIRONMENTAL FATE OF COAL GASIFICATION WASTES

PAH and phenolic compounds may enter the atmosphere through volatilization. Once in this matrix, the materials may undergo molecular or advective diffusion. (All further references to dispersion characteristics will infer both molecular and advective processes). PAH compounds are likely to undergo dispersion when introduced into surface water. If this occurs, the contaminants are very susceptible to adsorption onto clay particles suspended in the water. Depending on the nature of the surface water, this material may also volatilize; thus entering the atmosphere. Once in the surface water the PAH compounds are prone to chemical alteration through biodegradation or photolysis. Phenolic compounds are likely to undergo dispersion in surface water. They are not readily absorbed to clay particles. These compounds may also undergo volatilization and limited biodegradation in surface water.

PAHs in ground water are also likely to undergo dispersion and adsorption processes. Biodegradation of these materials is unlikely, however, in this matrix (Ref. 5). Phenolic compounds in ground water can be transported through dispersion. It is possible that these chemicals may undergo limited biodegradation in ground water environments (Ref. 5).

In the soil matrix, PAHs can be involved in adsorption processes as well as biodegradation reactions. These materials may also undergo volatilization, leaching, and photolysis depending on site-specific characteristics. Phenolic compounds in the soil environment can be leached readily or removed through biodegradation (Ref. 5).

PAH compounds are stable and tend to be retained in sediments. The specific stability of a particular PAH compound is dependent on its chemical structure (Ref. 8 and 5). Generally the stability/solubility is inversely related to the molecular weight of the PAH (Figure 3-1). The arrangement of rings is also important. For example, anthracene is relatively soluble. It is a medium mass PAH composed of three linear rings. The arrangement of the rings allow this relatively massive molecule to be soluble. Benzo(a)pyrene is composed of a single ring surrounded by rings on three sides of its six sides. It is one of the more massive PAHs.

This material is more stable than anthracene, the most soluble PAH. When the rings become arranged in a step-wise fashion, they are members of the most stable PAH group. An example of this is chrysene. The basic structures of the major PAHs are found in Figure 3-1.

PAH compounds are produced by both natural and man-made processes, including most combustion events. Coal tar products are composed primarily of PAH and phenolics; petroleum products may contain trace amounts of these materials. Removal of PAH materials through volatilization is not believed to be significant. Adsorption of PAHs onto soil particles is an important barrier to transport. This process depends on the physical/chemical properties of both soil and the transported material: characteristics of the chemical itself, soil moisture, temperature, availability of exchange sites on the soil particles, and pH. All PAH compounds except naphthalene are strongly adsorbed onto soil particles. PAHs may undergo microbial degradation, particularly the more water soluble and lighter compounds. For example, naphthalene is readily oxidized by Pseudomonas (Ref. 5).

Phenolic compounds are generally highly water soluble (in excess of 10,000 mg/l) and have low vapor pressures (Ref. 5). The low vapor pressure reduces the tendency for this material to volatilize. Phenolics are produced through both man-made and natural processes, including coal tar production, oil and chemical refinery processes, gray iron foundry operations, human/livestock wastes, and the decay of organic matter. Typical soil background levels of phenolics can range from 0.10 to 0.50 mg/l (Ref. 5). Phenolics are not absorbed by mineral particles, and their affinity for adsorption onto organic matter is limited. The adsorption of these constituents in the soil matrix is directly proportional to the abundance of organic matter in the soil. Biodegradation of phenolics is common, although high concentrations may temporarily repress the process. An example of a bacteria that can metabolize phenolics is Pseudomonas putida (Ref. 5).

Two types of cyanide may be present at a coal gasification site: simple and complex cyanides. Simple cyanides are formed when cyanide reacts with an alkali or metal, producing a soluble material that can liberate a CN^- anion in water. Simple cyanides can be decomposed by bacteria in the soil (Ref. 5). Complex cyanides are alkali-metal cyanides that are relatively insoluble (Ref. 5). Complex cyanides, particularly the ferrocyanide compounds, are more resistant to biodegradation. These materials are associated with oxide wastes.

The trace metals most likely to be found on a coal gasification site are: arsenic, chromium, copper, iron, lead, nickel, and zinc (Ref. 5). All are readily adsorbed onto soil particles. The mobility of these constituents is controlled by the pH of the soil. As a general rule, the solubility of these metals increases as pH decreases. Low pH values also reduce the cation exchange capacity of the soil matrix due to the preferential adsorption of H^+ ions. Cation exchange is generally considered the major barrier to metals transport in soils. The strong tendency of metals to be bound to soil particles and organic matter limits their impact on ground water resources.

The migration of coal tar in ground water has been observed in several former coal gas manufacturing sites (Ref. 5 and 9). Coal tar is more dense than water and tends to migrate downward through porous material to a confining layer of less porous material. In areas where this behavior is exhibited, the following stratification (from top to bottom) may be expected: ground water with dissolved organics; ground water with trapped coal tar; and, below the confining layer, ground water with dissolved organics (Ref. 5).

3.3 GENERAL WASTE STREAMS ASSOCIATED WITH ELECTRIC POWER GENERATION AND FUEL STORAGE

Waste products of primary concern are polychlorinated biphenyls (PCB). Commercial petroleum products such as diesel and heating oil are not considered hazardous under RCRA, 40 CFR 261.

A PCB is any one of 209 compounds with the general chemical formula $C_{12}H_xCl_{12-x}$. PCB are produced by chlorinating available biphenyl compounds and the different structural arrangements make possible 209 compounds distributed among the 10 levels of chlorination (Table 3-2, Ref. 10). Commercial PCB are produced by distilling chlorinated biphenyl mixtures. The name Aroclor is frequently used interchangeably with the term PCB, though not all PCBs are Aroclors.

PCBs are commonly found in transformers, power capacitors, hydraulic fluids, diffusion pump oil, and other heat transfer applications. Since 1971, the use of PCBs in the United States has been limited to the manufacture of transformers and high voltage capacitors. As of 1975, no substitute for the high dielectric and heat resistance properties and the non-flammable characteristics of PCBs was available (Ref. 11). In 1979, Congress banned the manufacture, processing, distribution, and use of PCBs except in completely enclosed systems such as electric transformers, capacitors, and electromagnets. Since this ban, various regulations have attempted to control further distribution of PCBs, including PCB that is incidentally generated along with some other desired product (Ref. 10).

The toxic effects of PCBs range from death in the lower invertebrates, to physiological disturbances in primates and humans (Ref. 11). PCBs in conjunction with other chemicals combine synergistically to increase risks of cancer at a much lower concentration than either chemical exhibits alone. PCB compounds are classified as human suspect carcinogenic, and are toxic substances regulated under the Toxic Substance Control Act (TSCA).

3.4 ENVIRONMENTAL FATE OF PCBs

PCBs are chlorinated aromatic organic compounds. They are very stable and cannot be decomposed by bacterial, enzymic, or any other biological or environmental activity. The PCB half-life is not known. Solubility in water is very low and depends on the amount of chlorination. As the percentage of chlorination in the molecule increases, the solubility decreases. PCB are very soluble in fats, and thus, they tend to accumulate in adipose tissue. The listed water quality criteria for PCB in fresh water and marine ecosystems is 0.001 ppb (Ref. 12).

PCBs can be extracted from water solutions using hexane. It can be absorbed from solutions or vapors by activated charcoal or polymeric resins (Amberlite XAD-4 or XAD-7). A common method of destroying the PCB molecule is through the use of special industrial furnaces. The decomposition of this class of molecules occurs at 24000° F.

Table 3-2
Distribution of PCBs by Level of Chlorination

Isomer Group	Molecular Formula	No. of Compounds
Monochlorobiphenyls	$C_{12}H_9Cl$	3
Dichlorobiphenyls	$C_{12}H_8Cl_2$	12
Trichlorobiphenyls	$C_{12}H_7Cl_3$	24
Tetrachlorobiphenyls	$C_{12}H_6Cl_4$	42
Pentachlorobiphenyls	$C_{12}H_5Cl_5$	46
Hexachlorobiphenyls	$C_{12}H_4Cl_6$	42
Heptachlorobiphenyls	$C_{12}H_3Cl_7$	24
Octachlorobiphenyls	$C_{12}H_2Cl_8$	12
Nonachlorobiphenyls	$C_{12}HCl_9$	3
Decachlorobiphenyl	$C_{12}Cl_{10}$	<u>1</u>
TOTAL NUMBER OF CONGENERS		209
=====		
Ref. 10		

SECTION 4: PHYSICAL SETTING

4.1 TOPOGRAPHY AND DRAINAGE

The site topography is essentially flat with a very gentle slope (0 to 3 percent) to the east. Locally the slope has been modified around buildings and other facilities.

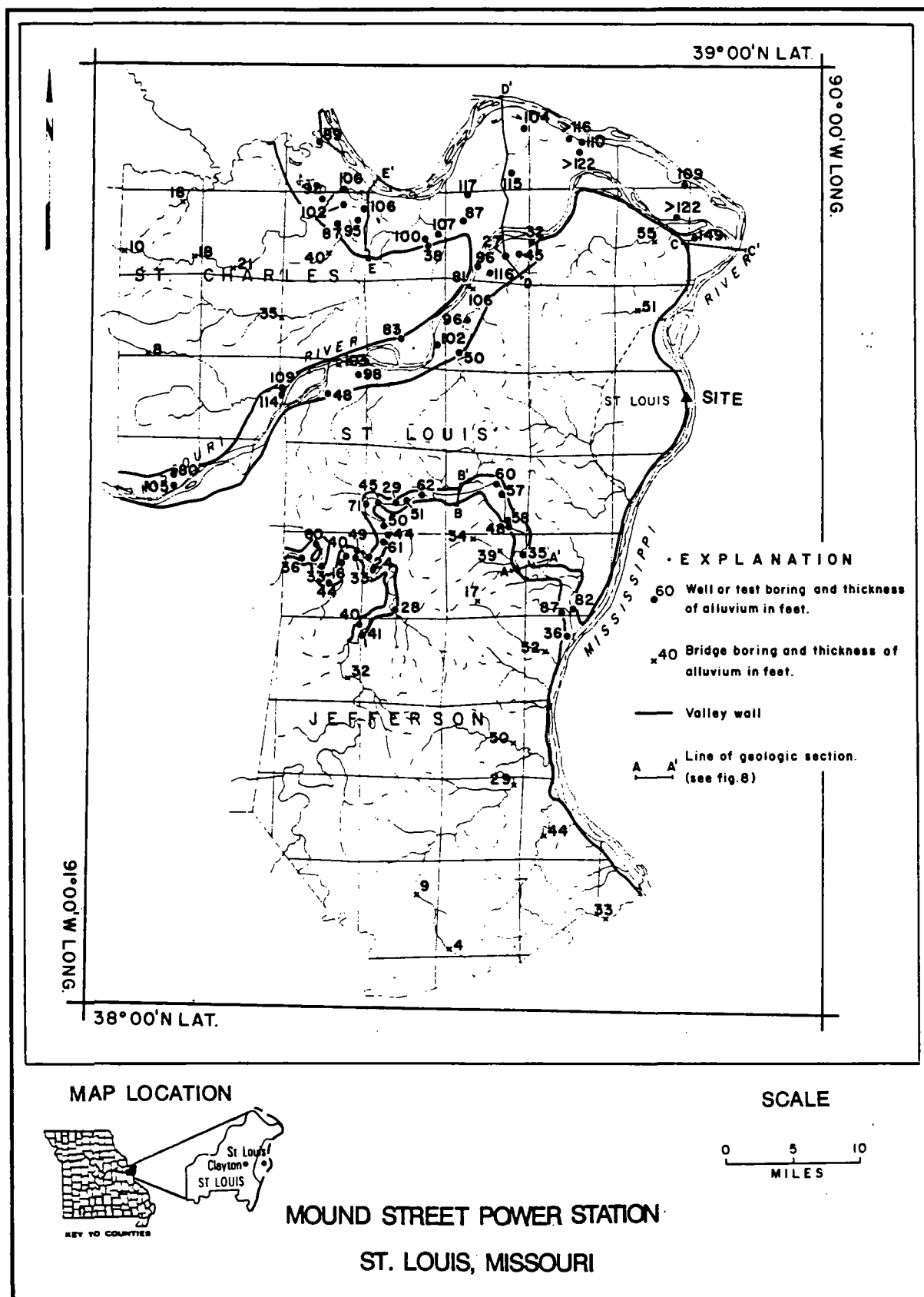
Surface drainage flows to the east directly into the Mississippi River. The site is protected from flooding by the U.S. Corps of Engineer concrete levee wall (Ref. 3).

4.2 SOILS AND STRATIGRAPHY

The soils in the area belong to the Harvester, Fishpot and Urban Land associations. These soils are classified as fine loams to fine silty clay loams. On site, the soils belong to the Urban Land, bottom land unit. This unit consists of areas in which more than 85 percent of the surface is covered by asphalt, concrete, buildings, or other impervious material.

The area was originally bottom land which was built-up to protect the site from flooding. The amount of fill in the area can range from 0 to over 200 feet. Variability of the soils in the area makes identification impractical without a detailed on-site investigation (Ref. 13). Figure 4-1 depicts the thickness of the alluvium along the Missouri, Mississippi, and Meramac rivers in St. Louis County.

The bedrock stratigraphy beneath the site belongs to the upper Mississippian and lower Pennsylvanian systems, which are roughly 286 to 360 million years old. Figure 4-2 shows that these systems are subdivided, in descending order, into the Pleasanton, Marmaton and Cherokee groups of the Pennsylvanian System, and the Meramacian series of the Mississippian System (Ref. 14).



WASTE SITE TRACKING NO.: MO0579
 PREPARED BY: JOHN C. PARKS

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 AREA MISSOURI

FIGURE 4-1 : ALLUVIUM THICKNESS ALONG THE MISSOURI, MISSISSIPPI
 AND MERAMEC RIVERS ST. LOUIS COUNTY MISSOURI

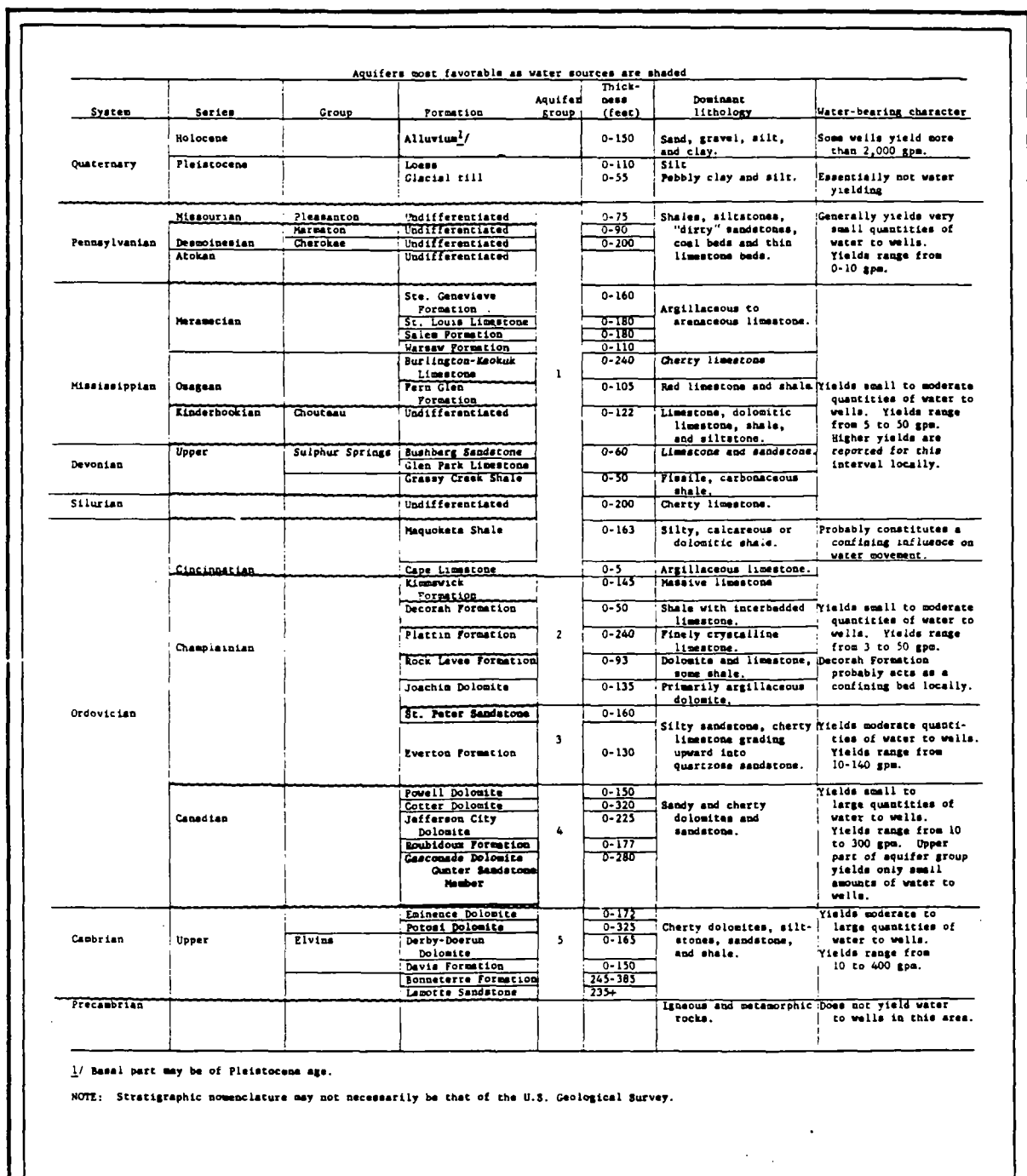
The Mermacian Series contains the following formations: Warsaw, Salem, St. Louis, and Ste. Genevieve. The predominant rock type is a finely crystalline, sometimes fossiliferous limestone with some dolomite. This series displays a typical cyclothemic succession (transgressive/regressive limestones with interbedded shales) though not necessarily a complete one. Chert is a very common accessory in the upper portions of the series (Ref. 14).

The overlying Pennsylvanian deposits are predominantly clastic in origin. However, numerous limestone, coal and shale beds occur. The lower groups (Cherokee and Marmation) have formal subdivisions while the Pleasanton consists of undifferentiated shales, siltstones, sandstones, coal, and, to a lesser degree, limestone (Ref. 14).

The specific stratigraphy beneath the site can be inferred from regional data. However, for more accurate information a more in depth, site specific geologic study would be useful.

4.3 HYDROGEOLOGY/WATER RESOURCES

The water needs of the city and surrounding community are met primarily through the withdrawal of surface water from the Missouri, Mississippi, and Meramac rivers. The municipal water intakes for the city of St. Louis and surrounding communities are approximately 9 miles upstream from the site (Ref. 1). The combined flow from the Missouri and Mississippi rivers averages approximately 1.12×10^{10} gallons per day. The Meramac has an average flow of 1.93×10^9 gallons per day. Withdraw from these rivers totals nearly 1.12×10^9 gallons per day (Ref. 7). Because there is an abundance of potable surface water, ground water is not utilized as a source of drinking water. The bedrock aquifers for the region are divided into five discrete units appropriately labeled one through five. Figure 4-3 shows the section view of the aquifers and Figure 4-4 shows the distribution. Group one, the Post-Maquoketa group, includes the strata above the Kimmswick Formation to the surface. Below this aquifer group lies the Maquoketa shale. Based on current information, the shale acts as an aquitard.



MOUND STREET POWER STATION

ST. LOUIS, MISSOURI

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: JOHN C. PARKS

ECOLOGY AND ENVIRONMENT F1T DEC. 1987
SOURCE: WATER RESOURCES ST. LOUIS
AREA MISSOURI

FIGURE 4-3: GENERALIZED HYDROGEOLOGIC SECTION ST. LOUIS COUNTY MISSOURI

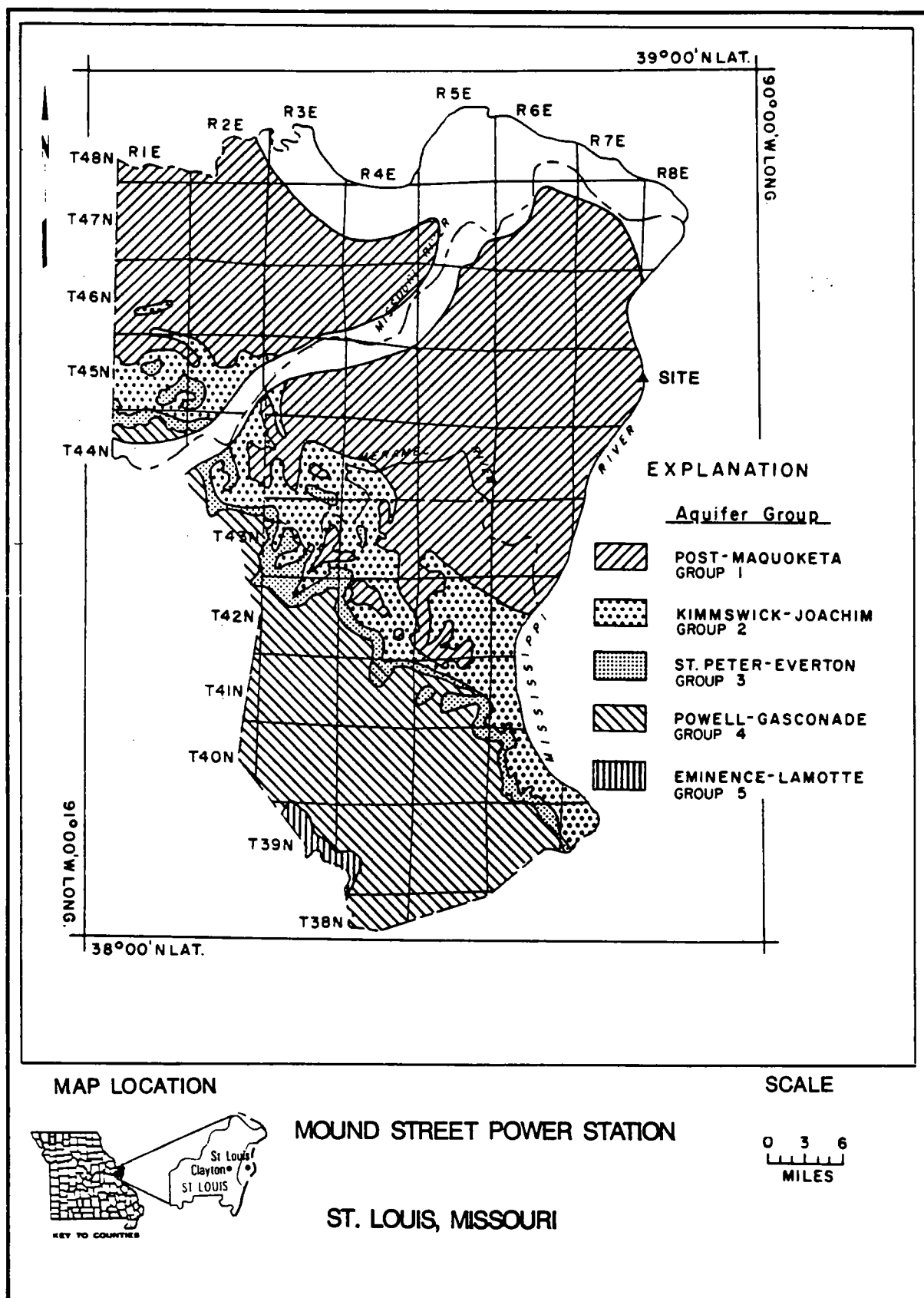


FIGURE 4-4; MAJOR AQUIFER DISTRIBUTION ST. LOUIS COUNTY MISSOURI

Group two is the Ordovician age Kimmswick-Joachim aquifer. Near the top of this unit is the Decorah Formation, which probably acts as a confining bed composed of shales and interbedded limestones. The remaining lower three aquifers are separated primarily on the basis of unconformities. It is likely these aquifer groups, in descending order, the St. Peter-Everton, Powell-Gasconade and the Eminence-Lamotte are hydraulically connected.

Generally the bedrock aquifers of the region yield very small quantities of water; roughly 0 to 50 gallons per minute (gpm). The alluvial aquifers (Post-Maquoketa) completed along the Meramac, Mississippi, and Missouri rivers can provide much larger quantities. For example, the Weldon Springs Ordinance Plant production well yields almost 2,000 gpm. Other large yield industrial wells may be located near the rivers so that water would be drawn from these surface sources.

Figure 4-5 provides the specific capacities reported for wells completed in the river alluvium. Specific capacity is the rate of discharge from a well expressed as gallons per minute per feet of drawdown. Generally, the higher the specific capacity the higher the transmissivity and therefore the greater the susceptibility to contaminant migration.

City or subdivision	Owner	Well location	Depth (feet)	Well diameter (inches)	Date of test	Pumping rate (gpm)	Duration of test (hours)	Specific capacity (gpm/ft drawdown)	Drawdown (feet)	Remarks
City of De Soto		39-A-3add	130	12	Aug. 1934	45	4	9.3	50	Potomac Delimita (Group 3)
	Burt Meier Nursing Home	39-S-20add	512	6	-	26	6	0.73	36	Lower part of Coonmouth Delimita (Groups 4 & 5)
	Robert Schroeder	39-S-31add	285	6	Jan. 1940	18	1	0.09	200	Jefferson City Delimita (Group 4)
	Blanche Combs Trailer Court	40-S-3-32	1030	4	1947	60	6	1.33	45	Somerset-Lamotte (Group 5)
	Jefferson County Memorial Hospital	40-A-17add	750	5	1955	88	24	0.66	176	Cotter-Lower part of Jackson (Group 4)
	Mississippi River Fuel Corp. River Canal	40-A-22add	1000	8	-	82	8	0.66	187	St. Peter-Upper part of Coonmouth (Groups 3 & 4)
City of Cedar Hill	Dow Chemical Co.	41-S-18add	390	-	1956	140	12	0.98	143	St. Peter-Everton (Group 3)
		42-S-25add	902	8	May 1953	50	-	0.24	212	Cotter-Delancey (Group 4 & 5)
	Jefferson County Water District No. 6	42-S-31add	1200	8	1967	130	24	1.63	80	Powell-Randolph (Group 4)
	Beaumont Bay State Reservation	43-A-21add	340	8	1930	50	24	0.64	113	Flattin-St. Peter (Groups 2 & 3)
Brian-Cliff Estates	Leonard Small Realty Co.	43-A-17add	675	6	Sept. 1959	23	24	0.21	107	Flammish-Everton (Group 2 & 3)
	Seaboard State Park	45-S-28add	1272	10	Aug. 1960	182	24	1.61	113	Jensen-St. Peter (Group 2 & 3)
	C. Kallman	46-S-7-20	655	6	Feb. 1936	120	4	0.89	135	St. Genevieve-Burlington (Group 1)
	Atlas Powder Co.	46-S-28add	811	8	Feb. 1941	13	3	0.07	200	Flammish-St. Peter (Groups 2 & 3)
Lake St. Louis		47-S-2-27	1375	8	Mar. 1970	140	4	0.76	193	Flattin-Randolph (Groups 2, 3, & 4)
City of O'Fallon	Well No. 3	47-S-20add	1500	8	Oct. 1960	132	2	2.66	50	Flammish-Upper part of Coonmouth (Groups 2, 3, & 4)
	Henneman Chemical Co.	47-S-23add	1397	10	April 1967	183	24	0.33	348	Flammish-Randolph (Groups 2, 3, & 4)
City of O'Fallon	Well No. 1	47-S-29add	933	8	Sept. 1960	55	24	0.25	221	Flammish-St. Peter (Groups 2 & 3)
Portage des Sioux	Portage des Sioux	48-S-15add	116	16	Mississippi River alluvium	500	4	48	10.5	10 acres
	Sine Wing	47-A-7add	100	16	-	2000	-	-	-	-
	Whitling Wing	47-A-11add	80	-	-	1230	-	85	14.6	-
	Lindberg & Ramsey	48-S-35add	106	16	-	2249	-	80	28	-
	Ore Farm	47-S-4add	92	-	-	1690	-	105	16	-
	Heritage Club	47-S-12add	106	16	-	1750	-	175	10	-
	Webfoot Club	47-S-12add	95	16	-	1900	-	83	23	32-ft screen
St. Charles	St. Charles	47-A-26	107	-	-	-	-	-	-	7-36,180 cubic feet per day per foot S=0.004
	Portage Farm	48-S-23add	107	24	Sept. 1963	1160	-	102	11.4	-
	Mr. Ambo	48-A-23add	102	16	Missouri River alluvium (195)	840	2	168	5	32-ft screen. Well not pumped at steady rate.
	Mr. Battie	48-S-17	96	12	-	600	-	-	-	32-ft screen
	Mr. Williams	48-A-28	83	12	-	600	-	69	13	-
	Weldon Springs Ordnance Plant	49-S-18add	127	15	1967	2450	47	-	-	Aquifer test. 7-36,180 cubic feet per day per foot S=0.2
Valley Park	Valley Park	44-S-18add	63	18	Meramec River alluvium (18 Aug. 1945)	504	24	72	7	15 ft of 18-inch screen
Valley Park	Valley Park	44-S-18add	63	18	July 1949	504	24	36	14	15 ft of 18-inch screen. Yield has increased to 47 gpm/ft after treatment for capacity loss.
Valley Park	Absorbent cotton	44-S-17add	63	16	Nov 1957	500	12	83	6	15 ft of 18-inch screen gravel pack.
Valley Park	Ashland Chemical	44-S-17add	59	16	Oct. 1959 June 1966	503 354	-	102 111	5 5	15 ft of 18-inch screen gravel pack.
Kirkwood	Kirkwood No. 1	44-S-15	37	18	Dec. 1926	300	10	60	5	18 ft of 18-inch screen
	Kirkwood No. 2	44-S-15	42	18	Nov. 1927	250	10	83	3	20 ft of 18-inch concrete screen.

MOUND STREET POWER STATION

ST. LOUIS, MISSOURI

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AREA MISSOURI

FIGURE 4-5: WELL SUMMARY FOR ST. LOUIS AREA

SECTION 5: POTENTIAL MIGRATION AND RECEPTORS

5.1 GROUND WATER ROUTE

It is highly probably that coal gasification wastes, if they are present on-site, are being released into local ground water. Since this preliminary assessment revealed no ground water use, there are no potential targets. If uses could be documented, then a potential target population could be identified.

5.2 SURFACE WATER ROUTE

Although the site is separated from the river by a levee, it is possible that materials potentially released into the ground water are being discharged into the Mississippi River. All city of St. Louis surface water intakes are approximately 9 miles upstream of the site. The only potential target populations are recreational uses, possible commercial fishing, and industrial intakes.

The oils contained in the basement may be hydraulically connected to the river by abandoned pipelines. This is the suspected migration route for oil that was the source of the three spills noted by the U.S. Coast Guard. Any oil releases to surface water would put the same targets at risk, that are at listed above.

5.3 AIR ROUTE

None of the potential wastes associated with this site have a potential for air release unless the facility is involved in a major structural fire. Because no PCB contaminants were detected in the oil, a fire would not cause a release of dioxin. A major fire could cause an air release of PAH materials, if the fire reached potential contamination areas. If an air release occurred it would target the majority of the St. Louis and or East St. Louis populations, depending on prevailing wind direction.

5.4 ON-SITE PATHWAY

If coal gasification wastes are present at this site, there is a great potential for direct contact with wastes. The population at risk would primarily involve local workers. Presently the E & E/FIT has no estimate of the size of this population. Direct contact with these wastes or contaminated soils could pose dermal, inhalation, and ingestion hazards.

SECTION 6: CONCLUSIONS

Based on the St. Louis Health Division and the E & E/FIT sampling there is no PCB contamination of the oils present in the basement of the former electric power plant. This statement is qualified in that the PCB detection limits were 1 ppm for the E & E/FIT data, and unknown for the St. Louis data. Concentrations of PCB below the 1 ppm detection limit are possible in the E & E/FIT samples. However, no evidence was uncovered suggesting that the oil in the basement should contain PCB. The initial concerns were raised based on the existence of large electric transformers located on site. The evidence suggests that the oil in these transformers was moved off-site. The most likely point of origin of the oil is the Apex Oil Terminal located several yards up-hill from the former electric power plant. This material is contained in a concrete basement and could be easily removed and sent to an oil recycling facility.

A search of historical documents provided information identifying this site as the location of the former Laclede Coal Gasification Plant. This facility may constitute the largest coal gas facility in Region VII.

SECTION 7: REFERENCES

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Appendix A
EPA Form 2070-12



POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

Mound St. Power Plant

I. IDENTIFICATION

01 STATE MO 02 SITE NUMBER

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) Mound Street Power Plant		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Number 2 Mound Street			
03 CITY St. Louis	04 STATE Mo	05 ZIP CODE 63101	06 COUNTY St. Louis	07 COUNTY CODE	08 CONG DIST
09 COORDINATES (LATITUDE 36° 38' 00" 0N		LONGITUDE 090° 11' 00" 0E			

10 DIRECTIONS TO SITE (Starting from nearest public road)

Take interstate 70 east from Kansas City to St. Louis. Exit onto interstate 55 north. Take the next exit, Memorial Dr., north. Travel on Memorial Dr. several blocks to Mound St. and turn right onto Mound St. The site is located at the end of Mound St.

III. RESPONSIBLE PARTIES

01 OWNER (if known) Herman Gellman, Pres. Mound St. Corp		02 STREET (Business, mailing, residence) 3620 North Hall St.			
03 CITY St. Louis	04 STATE MO	05 ZIP CODE 63147	06 TELEPHONE NUMBER (314) 2316077		
07 OPERATOR (if known and different from owner) none		08 STREET (Business, mailing, residence)			
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER ()		

13 TYPE OF OWNERSHIP (Check one)

☒ A PRIVATE ☐ B FEDERAL ☐ C STATE ☐ D COUNTY ☐ E MUNICIPAL
☐ F OTHER (Specify) ☐ G UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A RCRA 3001 DATE RECEIVED MONTH DAY YEAR ☐ B UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED MONTH DAY YEAR ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION <input checked="" type="checkbox"/> YES DATE 9 17 87 <input type="checkbox"/> NO		BY (Check all that apply) <input type="checkbox"/> A. EPA <input checked="" type="checkbox"/> B. EPA CONTRACTOR <input type="checkbox"/> C. STATE <input type="checkbox"/> D. OTHER CONTRACTOR <input type="checkbox"/> E. LOCAL HEALTH OFFICIAL <input type="checkbox"/> F. OTHER: CONTRACTOR NAME(S): Ecology & Environment, Inc.			
02 SITE STATUS (Check one) <input type="checkbox"/> A. ACTIVE <input checked="" type="checkbox"/> B. INACTIVE <input type="checkbox"/> C. UNKNOWN		03 YEARS OF OPERATION approx. 1973 1983 BEGINNING YEAR ENDING YEAR <input type="checkbox"/> UNKNOWN			

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

The oil in the former power plant basement may contain PCB. The wastes associated with the former coal gasification plant contain PAH, cyanide, metals, toluene and xylene.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

The potential PCB, toluene, xylene, PAH contaminants are carcinogenic. The potential cyanides, and metals have acute and chronic toxicities at relatively low environmental concentrations. Contact, inhalation and ingestion hazards exist for all potential contaminants.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (inspection required promptly) ☒ B. MEDIUM (inspection required) ☐ C. LOW (inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT Pauletta France-Isetts	02 OF (Agency/Organization) Region Superfund		03 TELEPHONE NUMBER (913) 236-2056	
04 PERSON RESPONSIBLE FOR ASSESSMENT Eric Hess	05 AGENCY Contractor	06 ORGANIZATION Ecology&Envir.	07 TELEPHONE NUMBER (913) 432-9961	08 DATE 1, 4 88 MONTH DAY YEAR



**POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION**

I. IDENTIFICATION

01 STATE MO	02 SITE NUMBER
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II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS**01 PHYSICAL STATES** (Check all that apply)

- ☐ A SOLID
☒ B POWDER, FINES
☒ C SLUDGE
☐ D OTHER oil
(Specify)
- ☐ E SLURRY
☒ F LIQUID
☐ G GAS

02 WASTE QUANTITY AT SITE

(Measure of waste quantities must be independent)

TONS _____

CUBIC YARDS unknown

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> A. TOXIC | <input checked="" type="checkbox"/> E. SOLUBLE | <input type="checkbox"/> I. HIGHLY VOLATILE |
| <input type="checkbox"/> B. CORROSIVE | <input type="checkbox"/> F. INFECTIOUS | <input type="checkbox"/> J. EXPLOSIVE |
| <input type="checkbox"/> C. RADIOACTIVE | <input type="checkbox"/> G. FLAMMABLE | <input type="checkbox"/> K. REACTIVE |
| <input checked="" type="checkbox"/> D. PERSISTENT | <input type="checkbox"/> H. IGNITABLE | <input type="checkbox"/> L. INCOMPATIBLE |
| | | <input type="checkbox"/> M. NOT APPLICABLE |

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		Coal Tar
OLW	OILY WASTE	unknown		Fuel Oil or transformer oil.
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	unknown		Coal tar xylene and toluene
IOC	INORGANIC CHEMICALS	unknown		cyanide salts
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		Coal tar Associated

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Coal Tar	800745-2	unknown	unknown	
SLU	Benzo (A) pyrene	50328	unknown	unknown	
OCC	Xylene	1330207	unknown	unknown	
OCC	Toluene	108883	unknown	unknown	
OLW	Fuel Oil	NA	Open Pools	unknown	
OLW	Transformer Oil (PCB)	1336363	Open Pools	undetected	1 ppm detect. limit.
MES	Lead	74439921			
MES	Arsenic	7440382			
IOC	Cyanide	57125			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

None

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, source analysis, reports)

E&E/FIT Files
 EP&R Files
 Missouri Department of Health and Hospitals



**POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

I. IDENTIFICATION

01 STATE MO	02 SITE NUMBER
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II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A GROUNDWATER CONTAMINATION unknown 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Coal tar wastes are potentially buried in unlined pits or stored in leaking containers.

01 ☐ B. SURFACE WATER CONTAMINATION 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown 04 NARRATIVE DESCRIPTION

Oil from site may have been released into the Mississippi River. If ground water contamination exists, it may allow release of contaminants into the surface water through surface water recharge.

01 ☐ C CONTAMINATION OF AIR 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

none observed or likely.

01 ☒ D FIRE-EXPLOSIVE CONDITIONS 02 ☐ OBSERVED (DATE: 9-17-87) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED unknown 04 NARRATIVE DESCRIPTION

The basement of the former power plant contains several thousand gallons of potentially flammable oil.

01 ☒ E DIRECT CONTACT 02 ☐ OBSERVED (DATE: 9-17-87) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED unknown 04 NARRATIVE DESCRIPTION

Soil contamination from coal gasification wastes is likely.
Soil contamination could allow direct contact with wastes.

01 ☒ F CONTAMINATION OF SOIL unknown 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

Soil contamination from coal gasification wastes is likely

01 ☐ G DRINKING WATER CONTAMINATION 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: none 04 NARRATIVE DESCRIPTION

Drinking water for St. Louis is obtained from surface water intakes over three miles upstream.

01 ☒ H. WORKER EXPOSURE/INJURY unknown 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Workers in the former power plant and at the Apex Oil St. Louis terminal (located on the former coal gas site) are not isolated from potential soil contamination.

01 ☐ I. POPULATION EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

none observed



**POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

40

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION02 ☐ OBSERVED (DATE: _____)☐ POTENTIAL☐ ALLEGED

none observed

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (include names of species)02 ☐ OBSERVED (DATE: _____)☐ POTENTIAL☐ ALLEGED

none observed

01 ☒ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION02 ☐ OBSERVED (DATE: _____)☒ POTENTIAL☐ ALLEGED

If materials are entering surface water, benthic organisms could bioaccumulate contaminants.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES02 ☐ OBSERVED (DATE: 9-17-87)☒ POTENTIAL☐ ALLEGED03 POPULATION POTENTIALLY AFFECTED: unknown

04 NARRATIVE DESCRIPTION

Oils stored in open pools in basement. (observed). Coal tar wastes, if present, may be stored in unlined pits. (Potential)

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION02 ☐ OBSERVED (DATE: _____)☐ POTENTIAL☐ ALLEGED

none observed

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION02 ☐ OBSERVED (DATE: 9-17-87)☐ POTENTIAL☐ ALLEGED

Sewers adjacent to site contain several feet of oil.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION02 ☐ OBSERVED (DATE: _____)☒ POTENTIAL☐ ALLEGED

Oil may be the result of unreported spills from the Apex facility.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None observed

III. TOTAL POPULATION POTENTIALLY AFFECTED: unknown**IV. COMMENTS**

Currently the site is considered to involve only the oil in the former power plant. The former coal gas site should be included in consideration of this site

V. SOURCES OF INFORMATION (City specific references, e. g., state files, sample analyses, reports)

E&E/FIT files.

EP&R files

St. Louis Department of Health and Hospital files.